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EXAMINER

PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1762

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DATE MAILED: 02/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/569518

Applicant(s)

R. Becker et al

Examiner

M.L. Padgett

Group Art Unit

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— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☐ Responsive to communication(s) filed on 4/28/00 & 9/28/00
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-20 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-20 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

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1. Claims 1-20 are objected to or rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claims 1 and 9 are objected to as having incorrect capitalization's within the claim, specifically after each step labeled by small roman numerals.

Claims 1 and 9 are vague and indefinite because their step iii) limitations use improper Markush terminology, that is open language "from the group comprising ... " so that it is uncertain what other deposition methods are or may be included.

Analogous problems are found in claims 3, 4, 6, 11, 12, 14 and 15.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 3, 6, 11 and 14 appear to

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recites the broad recitation Group 3B (and transition metals), and the claim also recites rare earth elements, actinides and lanthanides which is the narrower statement of the range/limitation.

Actually its not that straight forward, the phrasing is very nonstandard, and the exact intent is unclear, and might be described as claiming multiple overlapping terms, that may or may not be separate ranges.

Terms that are objected to as lacking proper antecedent basis include "said companion elements" (emphasis added) in claims 3, 4, 6 and 14, which are inconsistent with previous introductions; "composition" and "the environment" in step (v) of claim 9, while in steps (iii) of claims 1 and 9 "a method" uses the wrong article for a limitation introduced in the preamble, or alternately needs sufficient differentiation therefrom.

In claim 9, since the carrier gas maybe oxygen, excluding oxygen (claim 15) from other sources (claim 16), is less meaning full than probably intended.

The relationships of the "compound of boron" (claims 2 and 10) to the claimed "companion element" of the independent claim is not clearly defined. Pages 2-4, 19 suggest that the companion is the other element in the compound, such as LaB_{66} , etc., however the examiner found no disclosure of any B compounds that have at least 20 B for each H, Li, C, Na, Mg, N or S, hence exactly what feedstock is intended to be used is vague and indefinite. Note that disclosed compounds such as MgB_{12} do not fit the 20:1 ratio claimed.

2. Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as

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to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The body of the specification does not appear to contain the claimed "initial ratio... 20 or greater..." or explain the compound/companion element confusion or use of elements as listed in claim 4, with respect to any such restrictions.

3. The disclosure is objected to because of the following informalities: acronyms and abbreviations need to be defined, for example see "EDAX" on p.22.

Appropriate correction is required.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dowben et al.

Note that since the list of possible deposition methods in step (iii) is open ended, the laser induced deposition from solution taught by Dowben et al may be included. Particularly, see the abstract; col. 5, lines 23-30 and 66 – col. 6, line 30; col. 7, line 56 – col. 8, line 10 and lines 31- 59, where deposition from $Gd_2(B_{10}H_{10})_3$ precursor is disclosed. This provides a feed stock where 30 B: 2 Gd is 15:1 and also has hydrogen, producing a film that is “substantially” B, since GdB_6 has six times as much B than rare earth, Gd, and col 8, line 46 indicates that amorphous B may also be deposited. While the greater than 20 ratio is not disclosed, it would have been obvious to one of ordinary skill in the art to optimize the initial ratios of $GdCl_3$ and $B_{10}H_{14}$ which produces the $Gd_2(B_{10}H_{10})_3$ to drive the reaction and according to whether Gd borides or α -B was desired, where in either case an excess of the B-source would have been expected to be effective, hence the total B to Gd in the laser treated feedstock would have been expected to be within claimed ranges.

Note that as long as Gd reads on “a companion element” of the independent claim, it does not matter if H does or does not have the initial ratio, as only one companion element is required to do so.

Dowben et al notes that the solution acts as a heat sink, so is compatible for thermally sensitive substrates. This reads on the claimed temperature controlled. The

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claim of "voltage – controlled" is included because there is no positive limitation to how its controlled, hence application of 0 voltage may be considered to be controlled.

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-15 and 18-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 5,861,630. Although the conflicting claims are not identical, they are not patentably distinct from each other because the plasma generating process of the patent is encompassed by the application's broad "a method of depositing... comprising...plasma spray, cathodic arc, electric arc, direct heating,..." etc. Also, the patent's B to metal ratio of greater than 4:1 encompasses the applicant's 20:1 limitation. While not identical, the patent has overlapping elements in compound/companion elements, as well as in carrier gases. The patent claims the use of B-containing gas compounds, but does not specify any in particular, however one of ordinary skill in the art would recognize the B_xH_y compounds, such as B_2H_6 are conventional B-source gases, hence employ such, but to do so adds to B supply, with a

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"companion element" of H. Thus, the patent and application are seen to cover overlapping but different scopes, with obvious variation or paraphrasing of some limitations, and different orders. Note that all the heating steps would supply temperature control, and the patent's independent claims "accelerating..." step would supply voltage control of the substrate.

7. Claims 1, 5-9, 13-16 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabe et al.

Kawabe et al discloses formation of borides that include YB_{66} from generically $M_2O_3 + 15B \rightarrow 2MB_6 + 3BO$ (table 1 and col. 3, lines 66 – col. 4, line 35). The starting materials include B power with other companion elements in compounds, such as Y_2O_3 and Eu_2O_3 . While use of predetermined ratios is taught, what those ratios are, is not specified. A furnace is used for vaporizing under vacuum, where Ar is used as a carrier gas. For the reaction to go efficiently to completion, excess B would have been expected to be used by one of ordinary skill in the art, hence ratio of B to either Y or Eu would have been expected to be effective ^{ly} as claimed, and desirable in order to drive the reaction.

8. Also of interest are Tanaka et al who is growing YB_{66} crystal, but is not depositing any films. The Japanese references to Mitsubishi Electric may deposit a YB_{66} film on a Si substrate, but the abstract does not reveal the deposition process, and the figures show no apparatus. A translation has been order to determine if it has any further relevance.

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9. Any inquiry concerning this communication should be directed to M. L.

Padgett at telephone number (703) 308-2336, on M-F, from about 8 am – 4:30 pm, and


FAX (703) 305-5408 (official); or 305-6078 (unofficial).

M. L. Padgett/om

January 29, 2002

February 15, 2002

February 25, 2002



MARIANNE PADGETT
PRIMARY EXAMINER
GROUP 1700